

17. (Amended) An oxygen-free plasma etching gas formulation, which consists essentially of CHF_3 , Ar, and Cl_2 , wherein the gas formulation has a composition effective to remove an organic ARC disposed on a metallic layer while minimally affecting a pattern of a photoresist disposed on the organic ARC.

Sub D2
18. (Amended) The oxygen-free plasma etching gas formulation of Claim 15, wherein a ratio of flow rates of CHF_3 :argon:chlorine in the formulation is 5 to 80 sccm:5 to 80 sccm:5 to 60 sccm.

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19. (New) The oxygen-free plasma etching gas formulation of Claim 14, wherein a patterned photoresist is disposed on the organic ARC, and the gas formulation has a composition of the one or more fluorine-containing compounds, inert carrier gas and chlorine effective to remove the organic ARC while minimally affecting the pattern of the photoresist.

20. (New) The oxygen-free plasma etching gas formulation of Claim 14, wherein the photoresist has a thickness of around 7000-8000 Å.

Sub 3
21. (New) The oxygen-free plasma etching gas formulation of Claim 14, comprising more than one fluorine-containing compound.

22. (New) A reactor, comprising:

a reactor chamber;

a substrate including a metallic layer, an organic ARC disposed on the metallic layer and a patterned photoresist disposed on the organic ARC;

a gas source of the gas formulation according to Claim 14; and

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a plasma generating chamber in which a plasma is generated from the gas formulation to plasma etch the organic ARC,

wherein the gas formulation has a composition of the one or more fluorine-containing compounds, inert carrier gas and chlorine effective to remove the organic ARC while minimally affecting the pattern of the photoresist.

23. (New) The reactor of Claim 22, wherein the gas source is adapted to provide a ratio of flow rates of the one or more fluorine-containing compounds, inert carrier gas and chlorine of 5 to 80 sccm:5 to 80 sccm:5 to 60 sccm.

24. (New) The oxygen-free plasma etching gas formulation of Claim 15, wherein the chlorine is HCl or BCl₃.

25. (New) The oxygen-free plasma etching gas formulation of Claim 17, wherein the photoresist has a thickness of around 7000-8000 Å.

26. (New) A reactor, comprising:

a reactor chamber;

a substrate including a metallic layer, an organic ARC disposed on the metallic layer and a patterned photoresist disposed on the organic ARC;

a gas source of the gas formulation according to Claim 17; and

a plasma generating chamber in which a plasma is generated from the gas formulation to plasma etch the organic ARC while minimally affecting the pattern of the photoresist.

27. (New) The reactor of Claim 26, wherein the gas source is adapted to provide a ratio of flow rates of CHF_3 , Ar, and Cl_2 in the gas formulation of 5 to 80 sccm:5 to 80 sccm:5 to 60 sccm.